University of Information Technology and Communications (UoITC)

جامعة تكنولوجيا المعلومات والاتصالات

College of Medical Informatics

كلية المعلوماتية الطبية الحيوية

Department of Intelligent Medical Systems

قسم الانظمة الطبية الذكية

Third Cycle – Bachelor's Degree (B.Sc.) -

Science in Intelligent Medical Systems

بكالوريوس – علوم في الأنظمة الطبية الذكية

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1. Mission & Vision Statement

- ***Vision Statement***

The Intelligent Medical Systems Department is aspired to be a distinguished section of the local and international level in the field of supporting and developing health systems and developing scientific research and meeting the needs of government institutions and the labor market with the aim of improving the quality of the health care.

Leadership and excellence in developing an educational and research program in the field of biomedical informatics to meet the requirements of governmental institutions and the labor market at the local and international levels.

- ***Mission Statement***

The Department of Intelligent Medical Systems is a new specialty in Iraqi universities that links the specialty of information technology and medical information systems in order to prepare a distinguished graduate possess the skills needed to keep pace with advances in information technology and mastering them to medical and biological uses and who are qualified for competing in the labor market at the local and international levels.

Providing academic and qualitative programs to prepare graduates with high skills in the field of bioinformatics to be able to contribute in solving the problems of society of an interlaced nature between information technology and biomedical.

2. Program Specification

Program code	BSc-IMS	ECTS	240
Duration	4 level, 8 Semesters	Method of Attendance	Full Time

Intelligent medical systems, a field that is used in the development of smart medical technologies and systems, and the ability to keep pace with the rapid developments in modern digital medical technologies. Studying in this department we strive to enable students to design and innovate under the close mentorship of our world-class faculty. Our students learn by doing from their very first class, and quickly transition to authentic Technology projects with real-world corporate, government and nonprofit partners.

3. Program Goals

The Department of Intelligent Medical Systems seeks to prepare a distinguished graduate with the ability to:

1. Using and developing intelligent medical technologies and systems, and the ability to keep pace with the rapid developments in modern digital medical technologies, and competition in the labor market.
2. Assigning workers in the health field, including surgeons, analysts, and disease specialists, with systems that support their daily work and serve the achievement of results for medical diagnoses and analyzes in less time and with higher accuracy.
3. Collecting, discovering and analyzing medical data and knowing how to use it to serve scientific research and assist various agencies in achieving integrated health care.
4. Strengthening cooperation with interested sectors inside and outside Iraq.
5. Contributing to scientific research with various research ideas to assist to support and enhance the medical diagnosis systems.

6. Upgrading the student's personality by cultivating moral and human values and the national spirit and teaching them the skills of the art of leadership and searching for methods of solving problems and commitment to quality and professional behavior.

7. Providing students with the basic skills that enable them to deal with the environment and conditions of future work effectively, the ability to innovate and diversify, and to find important solutions to the problems they face accurately and quickly, given the importance of these two elements for the success of any medical diagnosis, whether it is manual or digital.

8. Creating an art of dialogue and constructive competition between students with each other, which will have a significant and distinguished reflection on professional work by promoting the spirit of teamwork and constructive professionalism.

4. Student Learning Outcomes

1- Intelligent medical systems aim to improve the quality of interventional health care in a way that depends on data collection, analysis, understanding and then employing smart systems that support specialists in this field, which will contribute to reducing medical errors resulting from the hard daily work of doctors and relying on self-assessment, which is not devoid of these errors.

2- The Department of Intelligent Medical Systems works to ensure that the academic program's outputs are based on principles and knowledge from a variety of research areas including artificial intelligence, medical image processing, data analysis, computer vision, bio-imaging, and medicine.

3- Committed to the ultimate goal of creating benefit for patients and medical staff, we aim to develop a holistic concept that spans three important topics: visualization and interpretation of data and real-time assistance and connectivity through a cycle of continuous learning: new spectral imaging technologies are enabled by machine learning deep learning as safe, reliable, and real-time imaging modalities during surgical interventions.

4- When interpreting perceived data in the context of available knowledge, our department specifically addresses common obstacles to clinical translation such as data scarcity, interpretability, and handling uncertainty.

5- With such cooperation with partners in the health and medical field, we can take advantage of these aforementioned methods to develop diagnostic assistance systems and digital analysis using various algorithms and tools in the field of information technology.

6- Transforming medical systems into a medical application machine available to all to facilitate the process of first diagnosis or self-examination by the patients themselves or by doctors who do not have sufficient experience to help them as a preliminary examination or preliminary diagnosis prepared for consultation by specialized centers.

7- One of the most important pillars that the department cares about is working to achieve high accuracy of digital examinations and analyzes, as well as reliable verification of the results of artificial intelligence algorithms and other tools that have been added to design and model various medical systems, applications and sites necessary to perform predictions, classifications of diseases and clinical diagnoses.

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6. Credits, Grading and GPA

- **Credit System**

The University of Information Technology and Communications adheres to the Bologna Process, implementing the European Credit Transfer System (ECTS).

The total number of ECTS required for the degree program is 240, with 30 ECTS earned per semester. Each ECTS corresponds to 25 hours of student workload, encompassing both structured and unstructured activities.

- **Grading**

Prior to evaluation, results are categorized into two groups: pass and fail. Consequently, the results are independent of the students who did not pass a course. The grading system is outlined as follows:

GRADING SCHEME مخطط الدرجات				
Group	**Grade**	التقدير	**Marks (%)**	**Definition**
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	FX – Fail	راسب - قيد المعالجة	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required
Note:				
Number Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.				

- **Calculation of the Cumulative Grade Point Average (CGPA)**

1. The CGPA is determined by summing the product of each module score and its corresponding ECTS, then dividing the total by the program's overall ECTS.

For a 4-year B.Sc. degree, the formula is as follows:

CGPA = [(1st module score x ECTS) + (2nd module score x ECTS) + ……] / 240

7. Curriculum/Modules

Semester 1: 30 ECTS: 1 ECTS = 25hrs

Module Code	Module Name in English	SSWL	USSWL	SWL	ECTS	Module Type	Pre-request
ITC300000	Biology	63	87	150	6	C	/
ITC300011	Computer Programming I	63	87	150	6	B	/
ITC300020	Computer Fundamentals	63	37	100	4	B	/
ITC310000	Mathematics	63	87	150	6	B	/
ITC310010	Introduction to Medical Informatics	63	87	150	6	C	/
ITC000000	Democracy and Human Rights	33	17	50	2	S	/
Total		378	372	750	30.00		

Semester 2: 30 ECTS: 1 ECTS = 25hrs

Module Code	Module Name in English	SSWL	USSWL	SWL	ECTS	Module Type	Pre-request
ITC300012	Computer Programming II	63	87	150	6.00	B	ITC300011
ITC310020	General Anatomy and Physiology	63	62	125	5.00	C	ITC300000
ITC310030	Molecular Biology	63	62	125	5.00	C	ITC300000
ITC310040	Logic Design	63	62	125	5.00	B	/

ITC310050	Medical Devices and Terminology	63	62	125	5.00	C	ITC310010
ITC000031	English Language I	33	17	50	2.00	S	/
ITC000041	Arabic Language I	33	17	50	2.00	S	/
Total		381	369	750	30.00		

Semester 3: 30 ECTS: 1 ECTS = 25hrs

Module Code	Module Name in English	SSWL	USSWL	SWL	ECTS	Module Type	Pre-request
ITC300030	Object Oriented Programming	63	87	150	6.00	C	ITC300011
ITC300040	Data Structures	63	87	150	6.00	C	ITC300011
ITC310060	Discrete Mathematics	33	42	75	3.00	B	ITC310000
ITC310070	Human Diseases for the Health Professions	63	87	150	6.00	C	ITC310050
ITC310080	Operating Systems	63	112	175	7.00	B	ITC300020
ITC000010	Crimes of the baath regime in Iraq	33	17	50	2.00	S	/
Total		318	432	750	30.00		

Semester 4: 30 ECTS: 1 ECTS = 25hrs

Module Code	Module Name in English	SSWL	USSWL	SWL	ECTS	Module Type	Pre-request
ITC310090	Biochemistry	63	87	150	6.00	C	ITC300011
ITC310100	Bioinformatics	63	87	150	6.00	C	ITC310010
ITC310110	Database Systems	63	87	150	6.00	B	/
ITC310120	Statistics and Probability	63	87	150	6.00	B	ITC310000
ITC310130	Data Science Ethics	33	17	50	2.00	S	/
ITC000032	English Language II	33	17	50	2.00	S	ITC000031
ITC000042	Arabic Language II	33	17	50	2.00	S	ITC000041
Total		351	399	750	30.00		

Semester 5: 30 ECTS: 1 ECTS = 25hrs

Module Code	Module Name in English	SSWL	USSWL	SWL	ECTS	Module Type	Pre-request
ITC300050	Artificial Intelligence	63	62	125	5.00	C	ITC300011
ITC310140	Image Processing	63	62	125	5.00	C	ITC310000
ITC310150	Geographical Information Systems	63	62	125	5.00	C	/
ITC310160	Applications Development	63	62	125	5.00	C	ITC310110
ITC310170	Software Engineering	63	62	125	5.00	B	/
ITC310180	Computer Networks	63	62	125	5.00	C	ITC300020
Total		378	372	750	30.00		

Semester 6: 30 ECTS: 1 ECTS = 25hrs

Module Code	Module Name in English	SSWL	USSWL	SWL	ECTS	Module Type	Pre-request
ITC300060	Web Development	63	62	125	5.00	B	ITC310160
ITC300070	Machine Learning	63	62	125	5.00	C	ITC300050
ITC310190	Computer Vision	63	62	125	5.00	C	ITC310140
ITC310200	Embedded Systems	63	62	125	5.00	C	ITC310080
ITC310210	Mobile Applications	63	62	125	5.00	C	ITC310160
ITC310220	Wireless Sensor Networks	63	62	125	5.00	C	ITC310180
Total		378	372	750	30.00		

Semester 7: 30 ECTS: 1 ECTS = 25hrs

Module Code	Module Name in English	SSWL	USSWL	SWL	ECTS	Module Type	Pre-request
ITC300080	Cloud Computing	63	62	125	5.00	E	ITC300060
ITC300090	Data Mining	63	62	125	5.00	C	ITC300070
ITC310230	Electronic Health Records	63	62	125	5.00	C	ITC310110
ITC310240	Deep Learning	63	62	125	5.00	C	ITC300070
ITC310250	Simulation and Modeling in Medical Applications	63	62	125	5.00	E	ITC310180
ITC300101	Final Project I	32	93	125	5.00	C	/
Total		347	403	750	30.0		

Semester 8: 30 ECTS: 1 ECTS = 25hrs

Module Code	Module Name in English	SSWL	USSWL	SWL	ECTS	Module Type	Pre-request
ITC310260	Big Data Analytics	63	62	125	5.00	E	ITC300080
ITC310270	Information Security	63	62	125	5.00	C	ITC310000
ITC310280	Health Care Systems Administration	63	62	125	5.00	C	ITC310230
ITC310290	Human and Computer Interaction	63	62	125	5.00	C	ITC310210
ITC310300	Medical Multimedia	63	62	125	5.00	C	ITC310140
ITC300102	Final Project II	32	93	125	5.00	C	ITC300101
Total		347	403	750	30.0		

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